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Feeding and Management of Sheep

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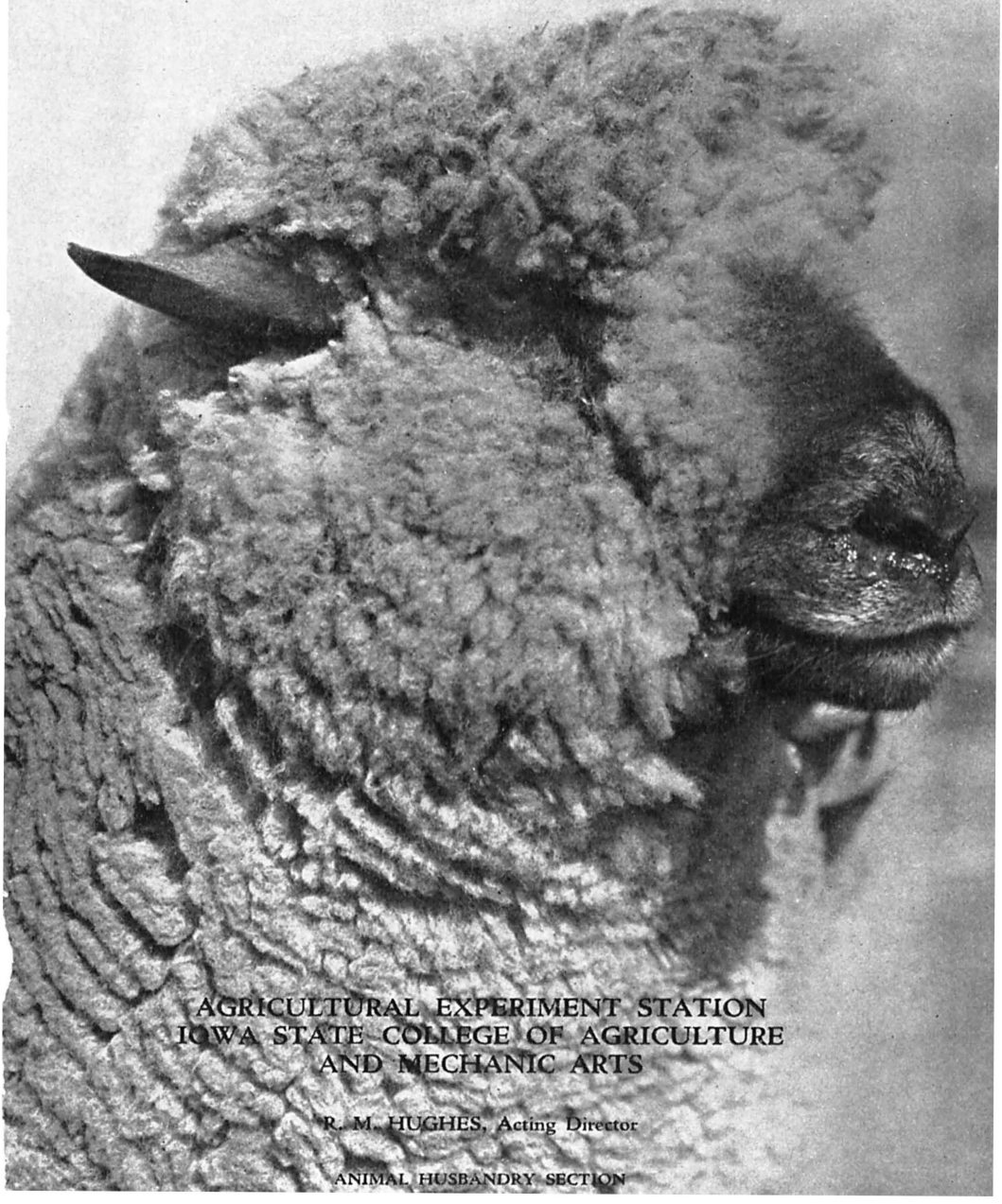
FEEDING AND MANAGEMENT OF SHEEP

By P. S. SHEARER



AGRICULTURAL EXPERIMENT STATION
IOWA STATE COLLEGE OF AGRICULTURE
AND MECHANIC ARTS

R. M. HUGHES, Acting Director

ANIMAL HUSBANDRY SECTION

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The Care, Feeding and Management of Sheep

By P. S. Shearer

THE SHEEP INDUSTRY IN IOWA

Sheep raising in Iowa is normally a profitable enterprise. All parts of the state are well adapted to it. Sheep production is not a major enterprise on most Iowa farms and probably should not be. Observation and experience indicate that the best plan is to keep a farm flock as a part of a diversified livestock production program.

Benefits from a flock of sheep kept on an Iowa farm come in several ways. First is the direct financial returns from the sale of lambs and wool; sheep rank high among farm animals in their ability to efficiently convert all kinds of farm grown feed into marketable animal products. Sheep also benefit the farmer greatly by keeping down weeds; they will eat a very high percentage of all weeds which grow in Iowa. Many farmers who keep a small flock feel that if no direct profits were derived from the flock it would still be a good investment because of this ability to keep the farm clean. In addition sheep, as well as other farm animals, help materially in solving the problem of maintaining soil fertility. A further source of profit from the farm flock comes from its ability to consume considerable quantities of rough feed which every farm has available and much of which would be unmarketable except when converted into some animal product. As sheep use much roughage and need little concentrated feed, they excel all other farm animals in this respect.

The total income derived from sheep in Iowa is not large as compared with the income from other kinds of farm livestock. If all benefits are considered, however, a farm flock will compare very favorably in return for each dollar invested. Many farmers experienced in handling sheep contend that over a period of years a small or medium sized flock of sheep is the most profitable livestock they have.

There are three rather distinct types of sheep enterprise practiced in Iowa. They are (1) the commercial farm flocks kept for production of wool and market lambs, (2) the purebred flocks to supply breeding stock and (3) the feeding of Western lambs. Problems encountered in the first two enterprises are very similar except in marketing the product.

This publication is designed primarily to answer the questions which flock owners and beginners in the sheep business are constantly asking and to serve as an aid to lamb club members.

TYPES AND BREEDS OF SHEEP IN IOWA

Two types of sheep are raised in Iowa. One is known as the mutton type because of its excellent mutton carcass and the other as the wool type because of its heavy fleece of fine quality wool. Commercial flocks of both types derive their profit from the sale of market lambs and from the wool clip. For this reason all sheep are, to a certain extent, dual purpose, and both mutton and wool qualities should be considered in producing either type.

In a flock of mutton type, most emphasis is put on the lamb crop as a source of income while in a flock of wool type, the wool clip is the first consideration.

Sheep of mutton type may be further divided into what are known as medium wool and long wool groups. Each has a similar mutton conformation, but the medium wool sheep has a rather dense, moderately fine fleece running from 2½ to 4 inches in length while the fleece of the long wool is longer,

Fig. 1. A Shropshire ram. Champion at the 1932 Iowa State Fair. Owned and exhibited by R. C. Yohe, of Allerton, Iowa.

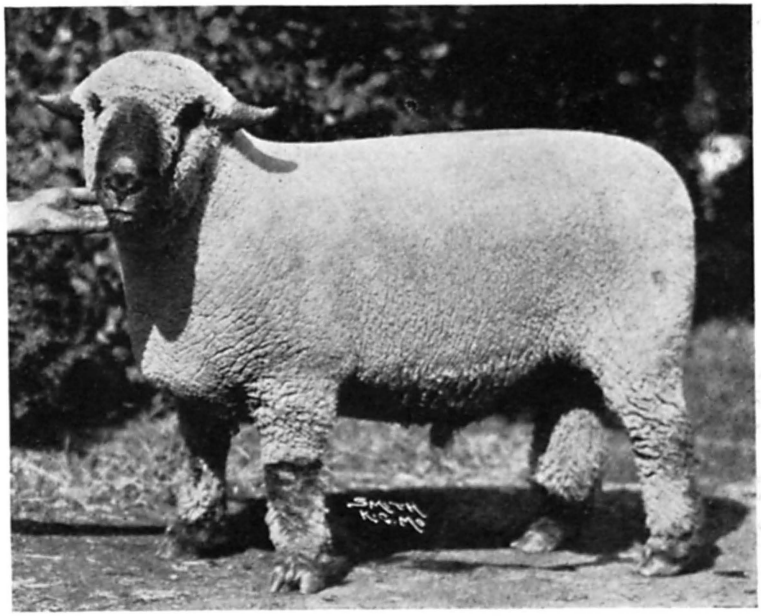

Fig. 2. A Hampshire ram. First in class at the 1932 Iowa State Fair. Owned and exhibited by R. E. Pullin, of Waterloo, Iowa.

coarser and more open. The wool type has a very fine heavy fleece. It excels the mutton type in both quantity and quality of wool, but it is not as good in carcass and feeding qualities.

CLASSIFICATION OF TYPES AND BREEDS

- Mutton type
  - Medium wool
    - Shropshire
    - Hampshire
    - Oxford
    - Southdown
    - Cheviot
    - Dorset
  - Long wool
    - Lincoln
    - Cotswold
    - Leicester
- Wool type
  - Rambouillet
  - Merino

Only a very brief description of the breeds common in Iowa is presented here. These breeds have all demonstrated their adaptability to Iowa conditions, so choice of a breed depends largely on community and personal preference.

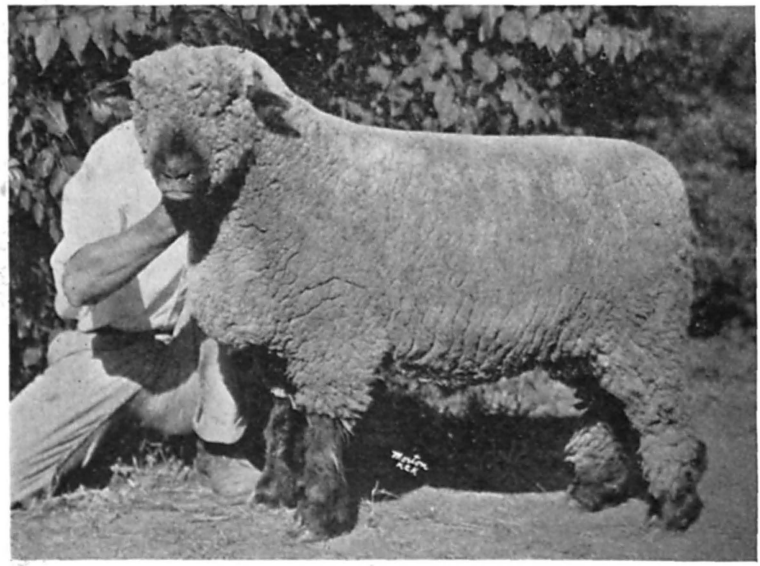

Fig. 3. An Oxford ewe. A prize winner at the 1932 Iowa State Fair. Owned and exhibited by T. A. McAlpin and Sons, of Villisca, Iowa.

The Mutton Breeds

Shropshire

The Shropshire is a medium-sized, early-maturing breed, distinguished from other mutton breeds chiefly by the complete covering of wool on the face and legs. The preferred type is low set and blocky in conformation with a small inconspicuous ear and a solid dark color on the nose, ears and pasterns. The fleece should be rather fine, dense and of medium length, and a clear pink skin is desired. The Shropshire has been very popular in Iowa and outnumbers all other mutton breeds. See fig. 1.

Hampshire

The chief distinguishing characteristics of a typical Hampshire sheep are the large black ears, the strong rugged head and the black markings on the face and legs. The face and legs are not as completely covered with wool as in the Shropshire, but bareness of legs and face is objectionable. It is a somewhat larger framed sheep than the Shropshire, but a rather low set, wide, thick conformation is desired with the large size. The Hampshire is noted for its strong constitution, active disposition and the rapid growth of its lambs. The fleece should

be moderately fine, medium in length, dense and free from black fibers. See fig. 2.

Oxford

The Oxford is the largest of the medium wool breeds, ranking slightly heavier than the Hampshire. The color markings on the face, legs and ears are brown. A medium shade is preferred to the light or dark color sometimes found. The wool covering on face and legs resembles that of the Hampshire. The size of the ear is also like the Hampshire, but a somewhat finer texture with more alert carriage is preferred. The Oxford fleece is rather long, moderately fine and fairly dense; in weight, it excels that of the other medium wool breeds. See fig. 3.

Southdown

The Southdown breed possesses an ideal mutton form—low set, thick and blocky. The size is relatively small; mature rams in breeding condition weigh up to 200 pounds and ewes from 140 to 160 pounds. They carry less wool on the face and legs than the Shropshire. The color is a rather light gray-brown and the ear small and alert. Southdowns produce a rather short, very dense fleece of fine quality which ranks next to the fine wools in size of fiber. See fig. 4.

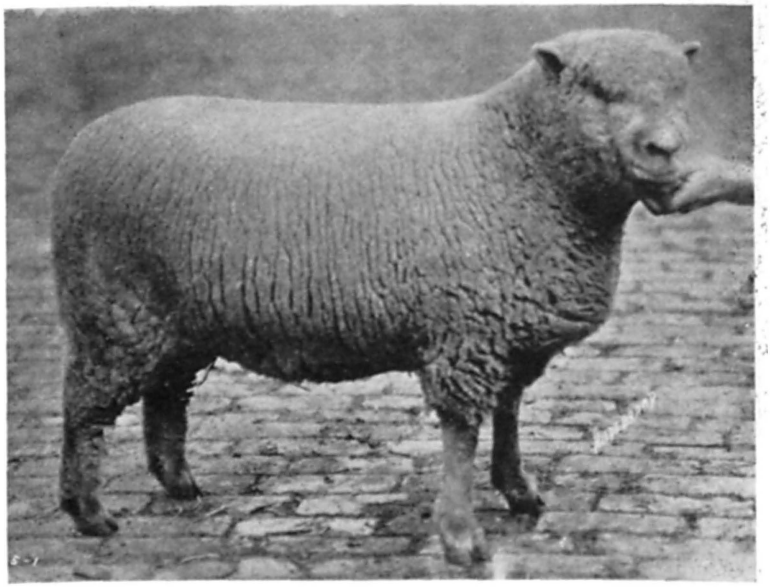

Fig. 4. A Southdown ewe. An International champion, bred and exhibited by Iowa State College.

Cheviot

The Cheviot is another small breed resembling the Southdown in size. These sheep are white in color of face and leg, with black lips, nostrils and hoofs, and with no wool on the head or legs. The ear is rather fine and upright, giving a smart appearance. The Cheviot is a very active breed and is well adapted to rough land and scant pasture. See fig. 5.

Dorset

The Dorset is the only medium wool breed with horns and, unlike the Merino, ewes as well as rams are horned. The color is white and the wool covering is similar to the Southdown. The breed is exceptional for its early breeding habits and for the prolificacy and milking qualities of the ewes.

The Long Wool Breeds

Cotswold, Lincoln, Leicester

The Cotswold, Lincoln and Leicester breeds represent this division of the mutton type in Iowa. They are large breeds, equal to or larger than the Oxford in mature weights. The

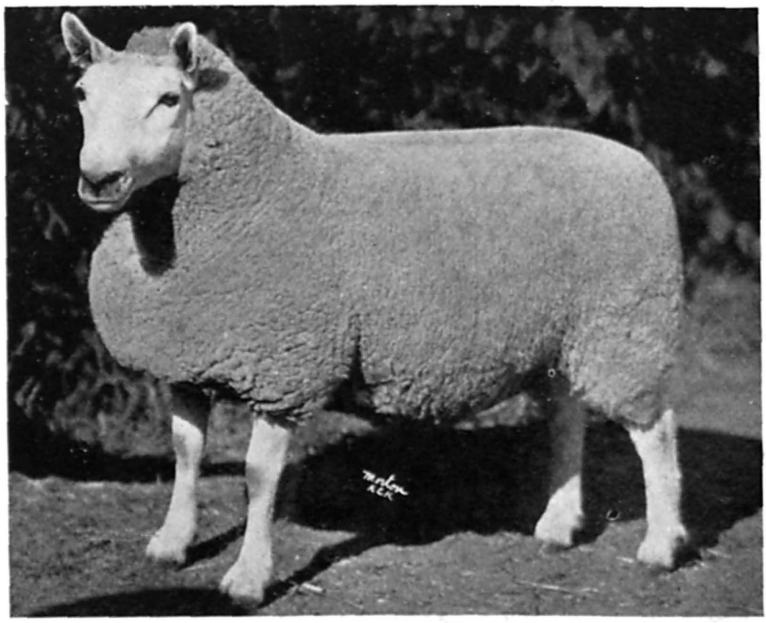

Fig. 5. A Cheviot ewe. Champion at the 1932 Iowa State Fair. Owned and exhibited by R. E. Pullin, Waterloo, Iowa.

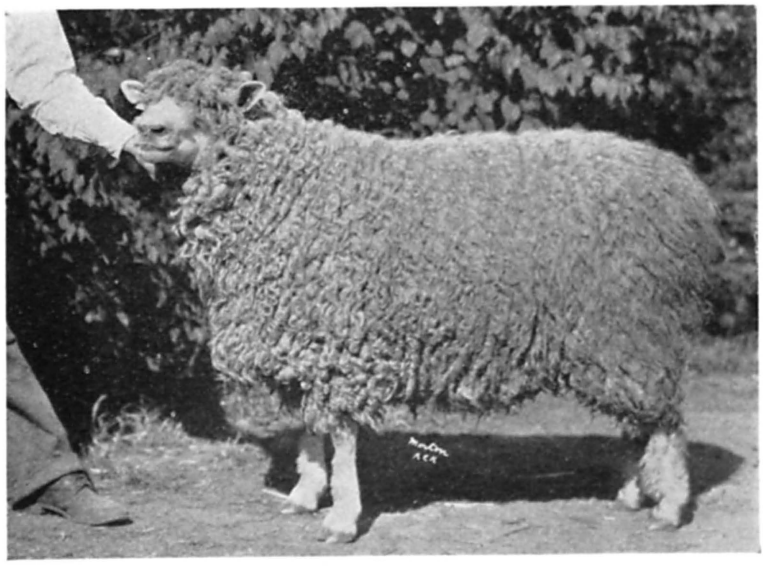

Fig. 6. A Cotswold ewe. Champion at the 1932 Iowa State Fair. Owned and exhibited by Joe G. Raim, Solon, Iowa.

fleece of these breeds tends to grow in locks; it is long with an open crimp and grades as common or braid wool. Size and heavy fleece weights are the chief characteristics which commend these breeds to the commercial sheep producer. See fig. 6.

The Fine Wool Breeds

Merino

Because of the difference in type, Merinos are divided into three classes known as "A," "B" and "C." Compared with the mutton breeds, all Merinos are deficient in mutton qualities, but they excel in both quantity and quality of wool produced. The "A" type is completely covered with wrinkles or folds in the skin while the "C" type is practically free from wrinkles except on the neck. The "B" type is intermediate between the other two. Mutton qualities are stressed most in the "C" type and least in the "A" type. The "C" type or Delaine Merino has found most favor in Iowa, especially in the southeastern counties. See fig. 7.

Rambouillet

The Rambouillet is a descendant of the old Spanish Merino. It was developed as a distinct breed in France and later im-

Fig. 7. A Merino ram, C type. First in class at the 1932 Iowa State Fair. Owned and exhibited by A. J. Blakely and Son, of Grinnell, Iowa.

ported into the United States. It is larger than the Merino and somewhat better developed in mutton form. Both "B" and "C" types are found in this breed. Like the Merino, it yields a heavy fleece of fine quality, but it is inferior to the strictly mutton breeds in carcass qualities. The Rambouillet breed has become particularly popular where sheep are raised under range conditions in the West and Southwest.

ESTABLISHING A FARM FLOCK

The best time to buy ewes to start or increase a farm flock is during the summer or early fall. Prices are lower at that time and there is a larger supply available, particularly on the open market.

There are two sources of supply to consider when breeding ewes are to be purchased. Usually native ewes can be picked up locally, and ewes of western origin are always available on the market. The native ewes have the advantage of being of better mutton type and can be inspected more conveniently than western ewes. There are several objections to native stock, however. They are rather apt to be infested with stomach worms, are frequently not uniform in type and prices are often higher than market values justify. Western ewes, such as can

be purchased on the open market, are usually free from internal parasites. A uniform group of any desired size can be selected and their value can be definitely established on any given market. Western ewes usually carry a predominance of fine wool breeding, hence they are not as good in mutton qualities as most native ewes, and ordinarily they will not be as prolific.

DETERMINING THE VALUE OF BREEDING EWES

The value of breeding ewes for the commercial flock must be determined by market conditions and prospects and by the individuality of the ewes themselves. The market value of lambs and wool is constantly changing and this brings about a changing value for breeding stock. Many factors pertaining to the ewes should also be considered in arriving at relative values.

Health and Vigor

Ewes that have good health and vigor are alert and active in appearance. Parasites and under-nourishment are frequently the cause of a lack of thrift which depreciates value for breeding purposes. Vigorous ewes have deep wide chests, strong heads, sufficient bone and a healthy looking skin and fleece.

Conformation and Size

The market wants lambs that finish at an early age and light weights. In general a low set, level backed, wide, deep bodied ewe with moderate size produces such lambs. Ewes that are too large, particularly if long legged and rangy, produce slow maturing lambs that are overweight when fat. Small ewes tend to produce lambs that do not attain good weight for age.

Fleece

An important part of the income from a farm flock is derived from the wool which the ewes produce. Furthermore, a tight fleece is a good protection from cold, wet weather. Ewes with heavy fleeces of good uniform quality are more valuable than ewes otherwise similar with poor, light fleeces.

Age

The useful age of a breeding ewe usually does not exceed 6 or 7 years. Yearling and 2-year-old ewes are most valuable and their value declines gradually until old age. When they are no

Fig. 8. Age changes in incisor teeth of sheep. At left, lamb's mouth with four pairs of milk teeth; at right, yearling mouth with one pair of permanent teeth.

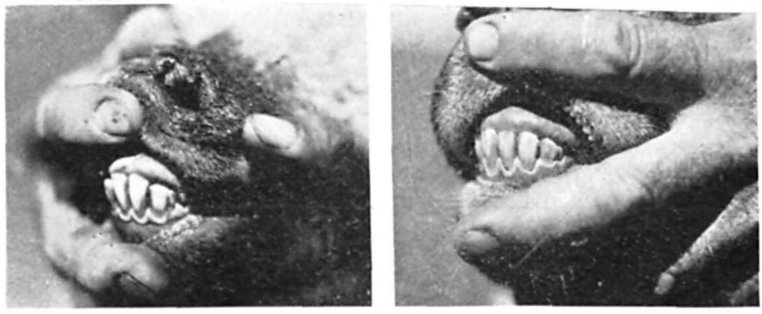

Fig. 9. Left—2-year-old mouth with two pairs permanent; right—3-year-old mouth with three pairs permanent.

Fig. 10. Left—4-year-old mouth all permanent; right—a broken mouth

longer useful for breeding purposes they are worth just what they will bring for slaughter on the open market.

The best single indication of age in a breeding ewe is the condition of the incisor or front teeth. The lamb has four pairs

of temporary milk teeth and the yearling has the middle pair replaced by a larger permanent pair. The three remaining pairs are replaced in order from the center out at intervals of a year or less. The 4-year-old mouth has normally four pairs of large permanent incisor teeth. There are variations in this schedule due to individuality, breed and character of feed, but it is a useful guide in age determination. After the fourth or fifth year it is impossible to determine the age in years; but the condition of the mouth becomes more important, as "broken mouthed" ewes are difficult to feed and their period of breeding usefulness is past regardless of their age in years. See figs. 8-10.

Other Factors

Other considerations frequently affect values. A ewe should have a soft pliable udder with two sound teats. Ewes are sometimes too thin or too fat to be desirable for breeding purposes. Lastly, uniformity is important in a group of ewes because they not only look better but produce a more uniform crop of both lambs and wool.

THE RAM

The head of the flock should always be a purebred. Breed is not so important as is the selection of a ram that will sire the right kind of market lambs and build up the ewe flock in the qualities desired. Crossing types is sometimes advisable. A flock of wool type ewes should be bred to a mutton type ram if all the lambs are to be marketed or if it is desired to grade up a flock of mutton type ewes. A flock of mutton type ewes should be crossed with wool type rams only if it is desired to breed up a flock of wool type ewes by saving the ewe lambs raised.

Many of the suggestions for selecting ewes apply to the selection of a ram. Yearlings are apt to be more active and vigorous than older rams and have a higher sale value after 2 years of use. One ram, if a yearling or older, should be sufficient for a flock of 30 to 50 ewes, depending on how he is handled. Ram lambs can be used with a smaller number of ewes, but it is doubtful if this is to be recommended as a general practice. A good ram purchased from a reliable breeder at a fair price is always a good investment. A poor ram is costly at any price.

THE BREEDING SEASON

Time to Breed

The period of gestation for the ewe is frequently given as 5 months. For accurate determination of lambing dates, however, a period of 147 days should be used. If February lambs are desired ewes should be bred in September while ewes bred in December will lamb in May.

Early lambs have several important advantages. They can be ready for the early summer market, thus getting in ahead of the heavy run which starts in late June and continues into the winter months. The extra labor and attention needed at lambing time is out of the way before spring work starts. Lambs kept through the hot summer months are subject to infestation with stomach worms which cause lack of thrift and consequent slow gains or even loss of weight and condition. Some favor the late lamb, however, claiming that less care and equipment is needed, that a larger percentage of lambs can be saved and that more of the lamb's gain is made on grass, thus lowering production costs.

The best time to breed must be decided by each flock owner after carefully considering the foregoing factors and his own particular conditions. Ordinarily it is believed that under conditions now prevailing the early lamb properly handled and marketed before July first will be more profitable than the late lamb marketed in the fall or winter.

Flushing the Ewes

For best results at breeding time, ewes should be increasing in weight and condition, especially those that are thin and run down in flesh. Feeding to bring about this improvement in condition is called "flushing." It can be accomplished by providing fresh grazing for which second growth clover, rape or fresh bluegrass are all good. If such grazing is not available, a light feed of grain, ¾ pound per head daily of oats or equal parts of oats and corn, is satisfactory. Flushing has been shown to increase the number of twin lambs. It may also bring the ewes in heat more quickly, thus insuring a more even lamb crop. Ewes should have excess wool clipped off at the dock to make service easier.

Care of the Ram

The ram should come to the breeding season in active, vigorous condition and moderate flesh. He can be run with the ewe flock, which is common practice, or he can be turned with the

ewes a part of the time which involves more trouble but enables him to breed more ewes.

If the ram runs with the flock and it is desired to know when each ewe is bred, some coloring material such as lamp black, venetian red or yellow ochre mixed with lubricating oil can be smeared between his front legs. In this way he marks the ewes on the rump as they are bred. By changing the color at 16-day intervals, ewes that fail to settle at the first service can be found.

If the weather is warm during the breeding season, it is sometimes advisable to shear the ram. If this is not done, the wool should be clipped around the sheath to make service easier.

A ram needs some grain shortly before and during the breeding season. Oats or a mixture of oats and bran fed at the rate of a pound or more a day makes a good ration. A little alfalfa or clover hay may be needed if the pasture is not good.

FALL AND WINTER MANAGEMENT

Feeding the Ewe Flock

Two important considerations govern the feeding of the pregnant ewe. These are (1) economy, and (2) the adequacy of the ration. Ewes may be carried through the winter very cheaply on an inadequate ration, but weak lambs, death losses and a poor wool clip will make this practice unprofitable. On the other hand, if ewes are fed without regard to cost a fine lamb and wool crop may again fail to leave a margin of profit. Economy in feeding is usually a matter of using home-grown feeds and insofar as possible salvaging everything grown on the farm that has feeding value.

Field Feeds

During the fall months, a flock of ewes on the ordinary farm will get much of their feed in the fields. Cornstalks, oat stubble, meadows, fence rows, orchards and pastures provide a variety of feed much of which is of little value unless utilized by livestock. The extent and length of time that such feeds can be depended upon to provide for the needs of the ewes varies. The size of the farm, the number of ewes, the weather and other factors must be considered. Ewes should not lose weight during pregnancy unless too fat at the start, a condition not often encountered.

The flock owner should keep in mind that the ewe during pregnancy must not only maintain herself in good health and vigor but must supply proper nourishment for the growing

fetus and the fleece. These demands call for a ration well balanced as to energy-producing nutrients, proteins and minerals. To the extent that field feeds will not reasonably supply these demands, additional harvested feeds must be supplied.

Roughages

For much of the period of pregancy a good legume hay is all that is needed. Clover, alfalfa and soybean hay have about equal value. Sweet clover hay is also good. Corn fodder can be used but needs a legume to go with it, and care must be taken to avoid overfeeding on corn. Timothy hay has very little value in the ration of the pregnant ewe and is not recommended. Oat straw can be worked into the ration in a limited way, but has little feed value.

If corn silage is available and properly fed, it will help to keep down the cost of winter feeding and seems to have a good effect on bred ewes. Several precautions should be observed in regard to the use of silage. Mouldy or frozen silage is dangerous and should not be fed to sheep. Silage from well matured corn gives best results. Do not feed excessive amounts of silage. For medium sized ewes 2 or 3 pounds per head daily is enough. A good legume hay should be fed with the silage. Failure to observe one or more of these precautions has probably led to the rather common belief that silage is not a good feed for pregnant ewes.

Concentrates

The judgment of the feeder and the condition of the ewes must determine when to start feeding grain. Usually some grain is advisable, but it may not be needed until shortly before lambing. For this purpose whole oats is considered by many authorities to be the best grain to use. A mixture of whole oats and shelled or broken ear corn is also good. Barley and other grains can be used if available, either alone or in mix-

Fig. 11. Combination grain and hay bunk. This type of bunk can also be used as a temporary partition.

tures. Such protein concentrates as bran and oilmeal are good feeds but they increase maintenance costs and are not usually advised when a leguminous hay is being fed. Of the numerous protein supplements, oilmeal and cottonseed meal have been most used. Whole soybeans and soybean oilmeal are also good. The choice of the common protein supplements, if such are to be used, depends largely on the price per ton.

The following rations are suggested, merely as guides. The size and condition of the ewes, the amount of field feed available, the quality of the various feeds, all must be considered, and proper adjustment made in each case according to the judgment of the feeder.

I.	Whole oats	.5 lb.
	Clover hay	3.0 lbs.
II.	Whole oats and corn, equal parts	.5 lb.
	Alfalfa hay	2.0 lbs.
	Corn silage	2.0 lbs.
III.	Whole oats	1.0 lb.
	Protein Supplement	.2 lb.
	Non-leguminous roughages, all they will eat.	

It is again emphasized that feeding breeding ewes economically and efficiently cannot be done by set formulas. Every situation differs and there is no substitute for experience and judgment on the part of the feeder.

Salt and Minerals

Salt should be provided so that the ewes can eat what they want. Either block of flake salt is satisfactory. Iodized salt may possibly have merit as a protection against goiter. It has not been definitely demonstrated that minerals other than these are helpful where a ration containing a legume hay is being used. A simple inexpensive mineral mixture, however, as insurance against possible deficiencies in the ration, adds little to the cost and certainly does no harm. A formula is suggested which can be made up at home or used as a guide in buying.

Flake salt	48	pounds
Limestone (high calcium)	25	pounds
Bone meal	25	pounds
Iron oxide	2	pounds
Potassium iodide	⅔	ounce

Sheep can be given free access to this mixture and should have salt in addition. Patented tonics and medicated feeds are seldom if ever needed. When ewes are not doing well the ration or method of handling is probably responsible, or there is some specific ailment which requires specific treatment.

Water

Ewes on dry feed will often consume a gallon of water per head daily if clean water is provided. Plenty of fresh, clean water seems to promote health. The chill should be taken off in cold weather to induce as much consumption as possible.

Exercise

Experience with the College and Experiment Station flocks indicates that lack of sufficient exercise during the winter months is apt to be a cause of trouble with both ewes and lambs at lambing time. During the fall while feed is available in the fields, the ewes will take sufficient exercise if given the opportunity. Difficulty comes during bad weather and after feed is no longer attractive in the fields. Scattering hay or other roughage over the ground some distance from the barns is a device sometimes used to induce exercise. Other plans will suggest themselves to the owner who is interested in his flock if he knows that regular, mild exercise is necessary for good results.

Shelter

Not many Iowa farms have a barn or shed designed and built for sheep. A shed or an improvised place in the barn furnishes the winter shelter. Healthy ewes will not suffer from cold if they are kept dry. Their quarters should be well ventilated and free from drafts. A deep shed open to the south or east is fine. Tightly packed dirt or clay floors are best. Ewes should be allowed from 10 to 15 square feet of floor space each depending on their size.

LAMBING TIME

Since considerably over one-half of the total income from the ordinary farm flock comes from the lamb crop, lambing time is a most important period in flock management. Extra time and careful attention at this period is usually well repaid in an increased number of lambs saved and in giving them a good start. As lambs which come in February and March are certain to encounter bad weather, good quarters must be provided.

Lambing Pens

For early lambing individual pens are desirable. They can be made by using panels 4 feet long hinged in pairs and set up in a warm corner of the barn. Any desired number of pens can be made along the side of the barn or shed by adding more

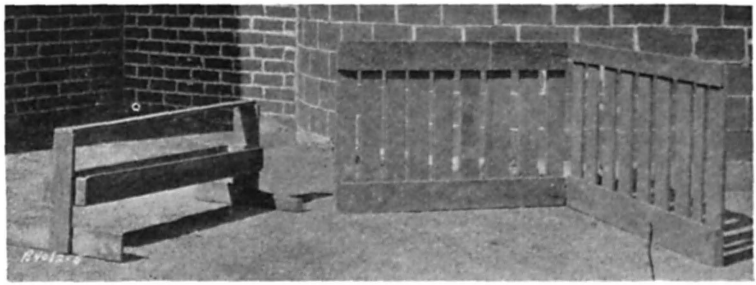

Fig. 12. Some homemade equipment. A grain bunk for lambs and a hinged panel for making individual lambing pens or lamb creep.

panels. There are several advantages in using such lambing pens. The ewe is not disturbed by the rest of the flock and the lamb cannot wander off and become disowned. Furthermore, each ewe and lamb can be given any special attention needed. The ewe can be placed in the pen either before or soon after lambing.

Several symptoms indicate when the ewe is about to lamb. The udder becomes distended and the teats fill with milk 36 to 48 hours before the lamb is born. The vulva also is enlarged. Immediately before lambing the ewe becomes restless, paws at the bedding and often calls for her lamb. These indications give opportunity to pen the ewe by herself if desired, although some shepherds prefer to let the ewe give birth to the lamb before disturbing her.

Delivery of the Lamb

If the ewes have been properly fed and handled and are in strong, vigorous condition, they will have very little trouble in giving birth to the lambs.. An occasional ewe having her first lamb may have difficulty, and if conditions during pregnancy have not been right much trouble may result. Normal presentation of the lamb is with front legs extended and the head between or resting on them. There are many variations from the normal, however, such as one or both front legs turned back, the head turned back, or even the back legs first. It is best not to disturb the ewe or attempt to assist her unless absolutely necessary. If labor has progressed past the normal time without results, assistance may be the only means of saving the lamb or ewe or both. The lamb must be put in such position that it can be delivered. The hand and arm should be disinfected and greased and an examination made to learn what is wrong and correct it if possible. Experience in such cases is

invaluable and no amount of written directions can equal even a little actual experience.

Care of the Ewe

The ewe needs special attention after lambing. If in high condition she should be fed lightly on hay but with little or no grain for several days. See that she is milking freely, that her bowels are functioning as they should and that the afterbirth has been cast. Water with the chill taken off can be given freely. If both ewe and lamb are doing well they can be turned back with the other ewes and lambs after 2 or 3 days.

The New Born Lamb

The membranes and mucus should be removed from the mouth and nostrils of the lamb as soon as it is born. Sometimes assistance is needed for the first nursing although strong lambs will usually get started without help. Make sure that the lamb gets some milk soon after birth. Chilled lambs can be warmed by wrapping in a warm blanket or by dipping in warm water and rubbing until dry.

The Orphan Lamb

Orphaned and disowned lambs are frequently a problem at lambing time. Patience will usually get a ewe to accept her disowned lamb or even a lamb from another ewe. For the first day or two the ewe recognizes her lamb by smell. Rubbing her milk on the lamb's rump and also on her nose will sometimes induce her to accept the lamb. With some ewes tying with a small halter for a few days with the lamb in the same pen is all that is needed. It may be necessary to hold the ewe for the first few times while the lamb nurses. Ewes differ in their willingness to adopt strange lambs and a method that will work for one will not work for others. Persistence will generally bring success.

If no ewe can be found to accept the lamb it is possible to raise orphans by hand. Milk from a fresh ewe should be provided for several days if at all possible either by holding the ewe for each nursing or by milking the ewe and feeding with a bottle. After the lamb is a few days old cows' whole milk may be used.

The secret of starting baby lambs on hand feeding is to feed small quantities of milk frequently and not to feed too much. For the first day an ounce or less at 2-hour intervals is sufficient. As the lamb gets older, increase the amount and the in-

terval between feedings. After 10 days of age 3 feedings per day are enough. The amount must be determined by the size and appetite of the lamb. More trouble comes from overfeeding than from underfeeding. Care must be taken to keep bottles and nipples clean, and while the lamb is young the milk should be fed at or near body temperature.

Docking

All lambs should be docked whether they are to be kept for breeding purposes or sold on the market. Docking should be done when the lamb is from 10 days to 2 weeks old. The tail should be cut about 1 inch from the body with either a sharp knife or a docking iron. The knife makes a clean wound which heals quickly but must be watched for excessive bleeding. The hot docking iron prevents bleeding but takes more time and the wound is slower to heal. Docking irons are made in both chisel and pincer forms. The iron is heated to a dull red heat and used until it has cooled so it no longer sears the stub, when it must be reheated.

Fig. 13. Docking with a hot chisel.

Castrating

All male lambs intended for market should be castrated. The large markets pay $1 per hundred more for castrated lambs than for lambs of similar weight, type and finish not castrated. For convenience male lambs may be castrated at the same time they are docked. The end of the scrotum is cut off to insure drainage and the testicles pulled out one at a time. The wound should then be washed off with a mild solution of coal-tar dip or other disinfectant. After being docked and castrated, lambs should be put in a clean place with fresh dry bedding and kept as quiet as possible for a day.

SPRING AND SUMMER MANAGEMENT

The most profitable procedure with February and March lambs is to push them for an early market. Early lambs cost somewhat more in terms of labor, feed and shelter than April and May lambs and unless they are marketed early ahead of the usual summer price decline much of the advantage of early lambing is lost. To bring top market prices lambs must be fat and of a desirable weight. Acceptable weights for spring lambs run from 65 to 90 pounds, but frequently lambs of the lower weights within this range are not finished sufficiently to bring top prices even though the weight is acceptable. Lambs weighing 80 to 85 pounds are most desirable, but they cannot be produced ready for the June market unless both ewes and lambs are fed well.

Feeding the Suckling Ewe

There is no feed equal to the ewe's milk for putting rapid gains on young lambs. The ration during the suckling period should be a good milk-producing ration. Some ewes, like some cows, are not good milkers, but in general ewes respond to an adequate suckling ration with a flow of milk sufficient for twin lambs. As during the pregnancy period the cost as well as the results must be considered in making up the ration, but generous feeding at this period is essential. Feeds suggested for the period just previous to lambing should be continued but the amounts must be increased. Especially is this true of the grain allowance. Good quality corn silage is particularly valuable at this time. Whole oats or various grain mixtures, a legume hay and corn silage if available, each fed in amounts to be determined by the judgment of the feeder will give good results. The silage and hay will not be needed after pasture is available but grain feeding is advised as long as the lambs are nursing. Two rations, one with corn silage, and one without, are presented as guides:

RATION NO. 1

Grain	1.0 lb. or more
Legume hay	1.5 lbs.
Corn silage	3.0 lbs.

RATION NO. 2

Grain	1.0 lb. or more
Legume hay	3.0 lbs.

Creep-Feeding Lambs

Lambs intended for early market should have grain as early as they can be induced to eat it. This is usually before they are

Fig. 14. A lamb creep made with a feed bunk and hinged panel. The slats can be adjusted to any size and as many openings made as desired.

2 weeks old. Creep feeding, which means providing a convenient place where the lamb can go and the ewe cannot, is the best way to grain lambs that are still running with the ewes. Equal parts of cracked corn and crushed oats make a good grain mixture. Bran is a good addition up to one-third of the mixture when the price is reasonable. Lambs can be allowed free access to such a mixture but it is well to put in only a little feed at a time and clean the troughs out daily, feeding the soiled feed to the ewes and giving the lambs fresh feed. After the lambs have started to eat grain whole oats and shelled corn are satisfactory, and as the lambs get older the proportion of corn should be increased as it is the best grain for fattening. Lambs should also have access to good leafy legume hay. A lamb creep is shown in fig. 14.

Late lambs are usually on grass almost from birth, and it is difficult to get them to eat grain, particularly if they are not accustomed to it before the grazing season starts. It is doubtful whether it pays to creep feed such lambs as they are ordinarily carried through the summer and put on the fall or winter market. In this case the lambs are fattened after they are separated from the ewes and weaned.

Pasture Considerations

Pasture and forage should be utilized to the fullest extent possible all during the grazing season. Three general plans for spring and summer grazing are open to the sheep grower. They are (1) the use of permanent bluegrass pasture throughout the grazing season; (2) the use of bluegrass pasture supplemented by various forage and temporary pasture crops, and (3) complete dependence on temporary pasture and forage crops.

The first plan is the easiest from the standpoint of labor and preparation and is perhaps fairly satisfactory for the small flock of 20 to 30 ewes. The chief objections are that it promotes worm infestation when sheep are kept continuously on the same land and that bluegrass pasture frequently furnishes little feed during July and August. For small flocks these objections can be partially overcome by the use of orchards, meadows and stubble fields.

The use of bluegrass pasture supplemented by temporary pasture and forage crops seems to be the most practical and satisfactory method of handling the farm flock in most cases. No specific plan can be given which will be suitable for all sections of the state and for variable weather conditions. Fall sown rye or wheat furnishes good early grazing frequently being available a month or more ahead of bluegrass. For best results such pasture should be grazed rather short to prevent rank growth which is not so palatable. This can be followed by spring sown peas seeded with oats or by oats seeded alone. Either soybeans or rape make good summer and fall grazing. (See figs. 15 and 16.) With favorable weather conditions both will produce a crop of forage if sown any time during the spring or up to midsummer. Alfalfa, red clover and sweet clover all make excellent temporary pasture. Because of their tendency to produce bloat some think they are better made into hay than to be used for grazing.

The use of such supplementary crops will require more labor and expense for seed and fencing but it increases the total carrying capacity of the farm and aids in keeping down parasites. By careful planning and reasonably favorable weather conditions a succession of crops can be secured which will eliminate the necessity of using permanent bluegrass pasture. On most Iowa farms it is not necessary nor desirable to entirely eliminate the use of bluegrass pasture.

Fig. 15. Ewes grazing on rape sown with barley.

Fig. 16. A patch of soybeans makes a fine temporary pasture. This field was planted May 25 and the picture was taken July 12. It is ready for grazing.

Shade and Shelter

While on pasture during hot weather sheep should always be provided with shade. Trees are fine except for the fact that the grass around them becomes infested with worms. For this reason some prefer a movable shade which can be put on clean ground occasionally and even moved to another lot or field if desired. A cool barn is a fine place for sheep during hot summer days. Some provision should also be made for sheep to get under shelter for protection from rain especially in the spring and fall.

Water and Salt

During the grazing season sheep should have free access to water and salt at all times. Stagnant ponds of water are bad because of the parasites they harbor.

SHEARING

Sheep can be sheared under ordinary farm conditions any time after April 15, although most of the shearing in Iowa is done during May. Much of the desirability of a wool clip is determined by the kind of sheep kept and their management throughout the year. Shearing methods and preparation for market, however, are important factors and should not be neglected. Sheep ought to be dry when sheared and the shearing should be done on a clean board floor or canvas. Much Iowa wool has a lowered market value because of the straw and chaff which it contains.

Either hand shears or clippers can be used but the clippers do a smoother job and are quicker and easier for the beginner. Clippers are operated by either hand power or mechanical pow-

er. The sheep to be sheared is set on its rump, back to the shearer and the fleece opened up on the brisket and belly. From this point methods differ but the object is to get the fleece off with as little tearing as possible and without second cuts in the wool or cuts in the skin.

After the fleece is sheared it should be spread out skin side down, dirt and tags removed and the side and head wool folded in. The fleece is rolled from the tail, thus leaving the skin side of the shoulder wool exposed. It can then be tied not too tightly and preferably with paper twine. Binder twine should never be used. It is customary to pack wool for shipping in 7-foot wool sacks which hold around 200 pounds. More complete directions for handling wool and information on grading and marketing can be obtained from Extension Service Bulletin No. 169.

CULLING THE EWE FLOCK

The best time to cull the undesirable ewes in the flock is after the lambs are weaned and before breeding begins. If the flock has been carefully watched or records have been kept, the ewes which were poor mothers and those which produced light weight undesirable fleeces will be known. These and the old ewes should be discarded and replaced with young ewes of good type and from good mothers.

FITTING MUTTON SHEEP FOR SHOW AND SALE

Lamb club members and breeders of purebred sheep can do a number of things to improve the appearance of their animals in preparing them for show and sale. If one is exhibiting at the county, district and state fairs it is absolutely necessary to do some fitting in order to meet competition. Where purebred rams and ewes are being sold for breeding purposes they present a much more pleasing appearance to the prospective buyer if they have been "dressed up" before being inspected. Skill in fitting comes with practice and experience.

For exhibition purposes the sheep or lamb should be in good condition. While economy in feeding is always important it may have to be sacrificed to some extent with purebreds being prepared for show or sale in order to have them well grown and in the best possible condition.

Training is also an important item. A sheep should be handled so that it will stand quietly, with its legs squarely under it and with its back level and head up. For showing in the ring the sheep should be held under the jaw, preferably with the left hand, leaving the right hand free to move the sheep about.

A good job of blocking and trimming also does much to improve appearance. (See fig. 17.) Before starting this work

the fleece should be examined to determine what is needed. Some very dirty fleeces must be washed but this should be done at least 6 weeks before the show. Washed fleeces never look as good as naturally clean fleeces that do not need washing so the best plan is to keep the fleeces clean. Stained spots about the dock and thighs may be washed without disturbing the remainder of the fleece. If the fleece has a few burrs these should be picked out. A fleece filled with burrs is difficult or impossible to prepare properly for show.

Each individual requires special treatment in blocking and trimming. Stand the sheep up with the legs under each corner and the weight evenly distributed and see what needs to be done. The purpose of blocking and trimming is to give the sheep straight lines, a compact, well balanced form and a smooth, dense-appearing fleece. The fleece should be dampened with a sponge or brush and the surface pulled out with a wool card and brush before using the shears. The back is first cut down beginning at the top of the shoulders and working back to the rump. If properly done this makes the top line appear straight and widens the back. The sides are then cut down in the same way and the dock and hind quarters squared. The sheep is now "blocked out" and the trimming which follows should smooth off all remaining parts and give an even, well balanced appearance to the body. For best results the trimming should be repeated after several days have elapsed and rough places levelled off to correct any mistakes that may have been made. Watching an experienced person trim a sheep is the best way to learn details many of which have not been given here. Blankets made of burlap or canvas may be used, if desired, to keep the fleece clean and to protect the surface after trimming.

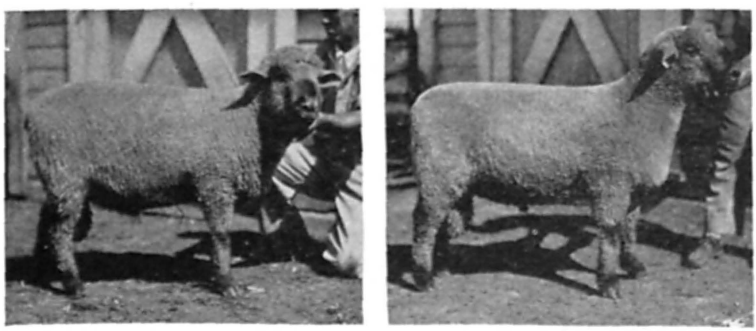

Fig. 17. At left, an Oxford yearling ram before being blocked and trimmed. This ram is also standing badly. At right is the same ram after trimming. Notice the improvement from standing squarely on all four legs.

SOME COMMON AILMENTS OF SHEEP

It is not the intention here to deal with all of the diseases and parasites to which sheep are susceptible. Only a few of the more common ailments are noted, and no attempt at complete descriptions will be made. Farmers' Bulletins 1155 and 1330 of the United States Department of Agriculture should be consulted. Call in a competent veterinarian in cases where there is serious trouble, for diagnosis and treatment may be difficult.

Stomach Worms

Observation indicates that the stomach worm is by far the most harmful parasite affecting sheep in Iowa. Almost all flocks are infested, some much worse than others. Damage is done mostly to the lambs although older sheep are also affected. The stomach worm is found in the fourth or true stomach, where it sucks nourishment from the lining and throws off a poison which enters the blood stream and destroys many of the red cells. Symptoms indicating infestation with stomach worms are numerous. General lack of thrift and loss of appetite is one of the first signs. The skin becomes pale and the membranous lining of the eyes when the upper lids are raised is colorless. Scouring and coughing and sometimes swelling under the jaw occur later.

Numerous treatments have been tried and recommended but the one which has been most effective with the College flock is the copper sulphate drench. The solution for this drench is made by dissolving 1 ounce of copper sulphate in 3 quarts of water. Larger or smaller quantities can be mixed with similar porportions. It should be mixed and kept in a glass or earthenware container and should be stirred frequently while using.

Sheep to be treated should be kept from water and feed for 12 to 18 hours before drenching and for 4 hours afterward. The following doses are recommended:

Lambs around 40 lbs.	1½ to 2½ oz.
Lambs 50 lbs. and up	2 to 3 oz.
Yearlings and mature sheep	3½ to 4 oz.

The size of dose for each individual in the groups as given above depends on weight, condition and age. For example, a 35-pound lamb in run down condition would get the lighter dose of 1½ ounces. It is important to get the dose right as too much is dangerous and too little is ineffective.

The drench can be given with a long-necked bottle, but a more convenient method is to use a long-nosed metal syringe of 4-ounce capacity with a plunger graduated to measure small doses. In drenching, the sheep should be backed into a corner

and the nose raised up level with the eyes. The syringe or bottle is inserted into one corner of the mouth and the drench allowed to trickle down slowly as the sheep chews and swallows.

The time to drench must be determined by the condition of the flock. If the flock is thought to be badly infested it may be advisable to drench the ewes a week or more before they go on grass. Several drenchings of both ewes and lambs may be given during the summer. In cases of bad infestation a second drenching at the end of 10 days or 2 weeks may be needed. Where lambs are marketed in June they will not usually need treatment. This is one of the advantages of early lambs. Where infestation is light those lambs and ewes showing signs of unthriftiness can be picked out from time to time and drenched.

Frequent changes of pasture and the use of forage crops for temporary grazing is a preventive measure. The life cycle of the stomach worm is such that if sheep are not allowed to graze long on the same ground infestation can be greatly reduced. For this reason the continued use of permanent bluegrass pasture is not advised.

Sheep Ticks

This external parasite of the sheep is very common in Iowa, although it does not do so much damage as the stomach worm. The sheep tick obtains its nourishment by sucking blood through the skin on any part of the body. In this way it causes irritation resulting in uneasiness, loss of wool by rubbing and general lack of thrift in the flock. Ticks can be found by opening the fleece as they usually stay on or near the skin. The sheep tick is rather flat, reddish brown in color and somewhat smaller than a common fly.

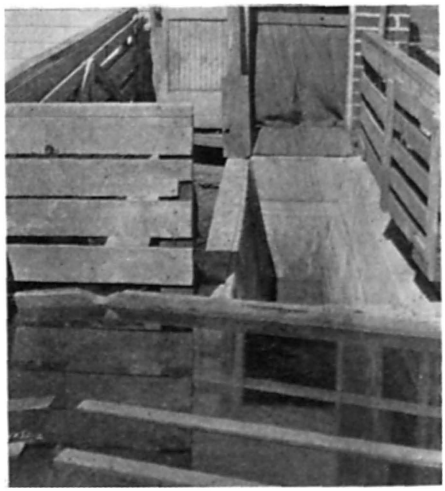

Fig. 18. Dipping vat. This picture was taken from the upper end of the dripping platform. The sheep are pushed through the burlap curtains, held the required time in the solution, and come out onto the platform to drip. Note the arrangement for the dip to run back into the vat.

Ticks can be controlled by dipping (see fig. 18), which is best done soon after the ewes are sheared. Both lambs and ewes must be dipped. If the infesta-

tion is particularly bad two dippings at 10-day intervals may be needed. If they still carry ticks in the fall another dipping can be given. The standard dips, either arsenical or coal-tar, can be used if directions coming with them are carefully followed. Dipping must be done on a warm day and preferably early in the morning to give the sheep time to dry. When a flock of sheep is free from ticks care should be taken when new sheep are added that ticks are not brought in.

Maggots

Wet or filthy spots in the fleece and open wounds in the skin attract the maggot fly in warm weather. Eggs are laid in such places and hatch out in a few hours. Maggots then eat their way through the skin and into the flesh. A sheep with maggots is restless and reaches for the affected part with its mouth. Treatment consists in cleaning the area affected and applying pine tar, ordinary black wagon grease or a kerosene emulsion. Keeping sheep free from tags and dung locks, and castrating and docking before the fly season will largely prevent trouble with maggots.

Grub in the Head

This trouble is caused by larvae which have worked their way into the nasal sinuses in the sheep's head. The irritation causes great discomfort and in late winter and early spring brings a bloody discharge from the nostrils and frequent violent sneezing. Treatment is largely preventive as once the larvae have entered the sinus they are difficult to reach.

The sheep bot-fly is responsible for this trouble. It deposits the living larva in the sheep's nostrils during the summer months. This can best be prevented by smearing the nose with pine tar or making the sheep smear its own nose by putting the tar on a narrow salt box.

Bloat

This ailment is caused by a rapid fermentation of feed and production of excess gas in the paunch. Heavy feeding on green alfalfa, clover, rape or other forages is usually the cause. Grazing on such crops does not always cause bloat, however, and danger from bloat should not prevent their use. Sheep should be watched rather closely when on such grazing and should not be put on when hungry. Some believe that the danger is greatest after heavy dews or rain, but experience with the College flock indicates that most trouble comes in the afternoon. In spite of all known precautions, cases of bloat will sometimes occur and they develop rapidly. Different treatments are recommended. A drench of 1 pint of freshly drawn cows' milk is effective if it can be administered quickly. A small stick used as a bridle bit will sometimes help by keeping

the mouth open and allowing the gas to work off. In bad cases the only effective remedy is the use of a trocar inserted 3 inches in front of and a little below the hip bone.

Constipation

Frequently young lambs show symptoms of constipation by straining and hard dry droppings. An enema of warm soapy water and a teaspoonful of castor oil will relieve the condition.

Scours

There are numerous causes of scours in sheep and lambs. Scours in young suckling lambs are usually the result of digestive trouble and unless the cause is eliminated remedies are of little value. A good ration for the ewe with the proper amounts of each feed is essential. The lamb may be getting too much milk. Scours are sometimes caused by too much grain when the lamb is not accustomed to it.

ADDITIONAL SHEEP BULLETINS AND CIRCULARS

This circular has been prepared as a brief discussion of farm flock management in Iowa. The reader is referred to the following circulars and bulletins for more detailed information on special subjects. They may be obtained from the Bulletin Office, Iowa State College, Ames, Iowa.

Soybeans and Alfalfa Hay for Wintering Pregnant Ewes—B282.
Corn Supplements and Substitutes for Fattening Lambs—B185.
Corn Substitutes for Fattening Lambs—B210.
Cane and Beet Molasses for Fattening Lambs—B215.
Soybean Hay for Fattening Lambs—B234.
Corn Preparation and Roughage Comparisons for Fattening Lambs—B299.
Growing and Marketing Iowa Wool—E169.
Dressing and Cutting Lamb and Mutton on the Farm—C71.
Some Weedy Grasses Injurious to Livestock, Especially Sheep—C116.

For the following publications write to the United States Department of Agriculture, Washington, D. C.

Farm Sheep Raising for Beginners. Farmers' Bulletin No. 840.
Equipment for Farm Sheep Raising. Farmers' Bulletin No. 810.
Breeds of Sheep. Farmers' Bulletin No. 576.
Castrating and Docking Lambs. Farmers' Bulletin No. 1134.
Raising Sheep on Temporary Pastures. Farmers' Bulletin No. 1181.
Flushing and Other Means of Increasing Lamb Yields. Farmers' Bulletin No. 996.
Diseases of Sheep. Farmers' Bulletin No. 1155.
Parasites and Parasitic Diseases of Sheep. Farmers' Bulletin No. 1330.
The Sheep Tick and Its Eradication by Dipping. Farmers' Bulletin No. 798.
Sheep Scab. Farmers' Bulletin No. 713.